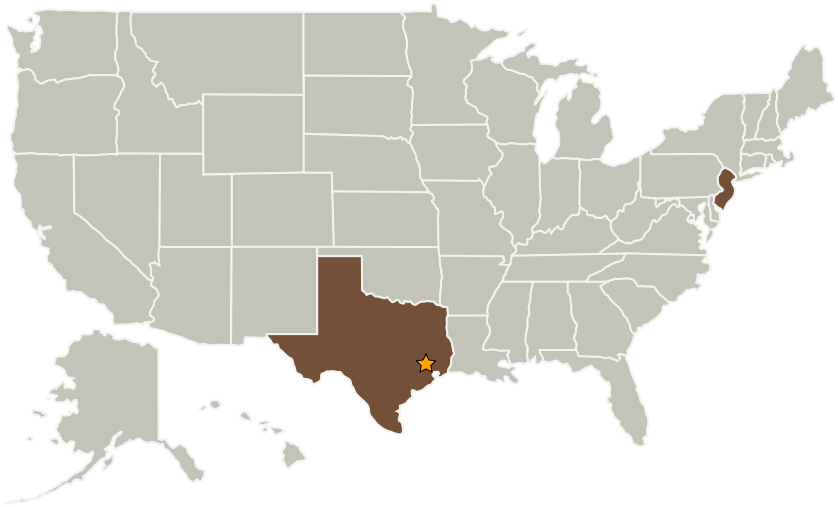
Battery Separator Membrane Having a Selectable Thermal Shut-Down Temperature, Phase II

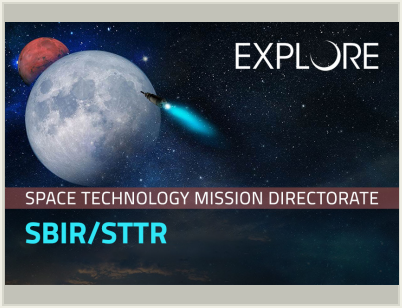
Completed Technology Project (2004 - 2006)

Project Introduction

This Small Business Innovation Research Phase II proposal to NASA requests $596,750.96 support for Policell Technologies, Inc. to develop a series of separator membranes having a selectable thermal shut-down temperature for a period of 24 months. The separator will be used in the making of high performance batteries. This proposal responds to Topic Number F3.09, "Power Technologies for Human Missions". The innovation is the development of a novel separator membrane that has a selectable thermal shut-down temperature. The Phase II plan is to develop the following 5 grades: 120, 110, 100, 90, and 80oC. The significance of the innovations is that with the use of the novel separator, the resulting rechargeable lithium-ion battery will: 1) have a selectable and significantly lower thermal shut-down temperature than that of the commercial separators. Thus, the cells will be much safer, 2) offer higher energy density, 3) have longer cycle life, lower as well as stable impedance during charge-discharge, 4) offer ultimately overall low cost. The commercial applications include for making battery as mobile power sources for devices such as cellular phones, notebook computers, military used devices, and hybrid electric vehicles (HEV). The NASA applications include mobile power sources for space. The Principal Investigator, Dr. Luying Sun, is qualified to perform this work as he has been an expert in this field. Since 1993, the Principal Investigator has been involved in the research and development of separator membrane, electrolyte, and lithium-ion battery.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Policell Technologies, Inc.	Supporting Organization	Industry	Newark, New Jersey

Primary U.S. Work Locations	
New Jersey	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.1 Electrochemical: Batteries